



NDM1L Series Residual Current Operated Circuit Breakers

2019 Edition

Nader

1. Product Overview

			
Model	NDM1L-32	NDM1L-50	NDM1L-100
Rated Voltage	AC230/240V(1PN、2P) AC380/400/ 415V(3PN、3P、4P)	AC230/240V(1PN、2P) AC380/400/ 415V(3PN、3P、4P)	AC230V(1PN、2P、3PN、4P) AC400V(3P)
Rated Current	1A、2A、3A、4A、5A、 6A、10A、16A、20A、 25A、32A	6A、10A、16A、20A、 25A、32A、40A、50A、 10A、16A、20A、25A、 32A、40A、50A	50A、63A、80A、100A
Rated Residual Operation Current	30mA、50mA、 100mA、300mA	30mA、50mA、 100mA、300mA	100mA

2. Product Features

● Applicable Scope

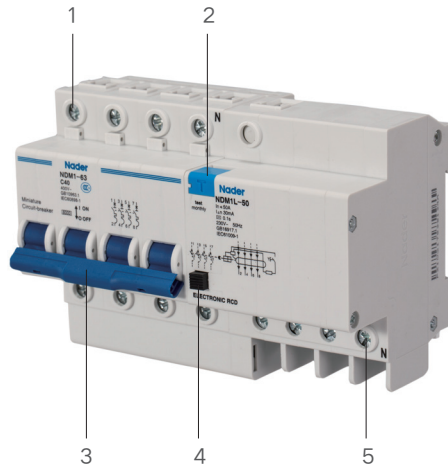
NDM1L-32, NDM1L-50 and NDM1L-100 Series RCBOs are linked to the right side of both NDM1-63 and NDM1-125. These series RCBOs can protect people from direct or indirect electric shock, protect the circuits from earth leakage. RCBOs are widely used in Low-voltage distribution of industry, civil building, energy, telecommunication and infrastructure etc. to protect the circuits from short circuits, over-current, leakage, disconnection and over/under-voltage.

● Design Features

- ◆ Visual window's design: Make the product's switching-closing status more clearly to see.
- ◆ Modularized and Assemble Structure: Easily to remove and mount.

● Structure Features

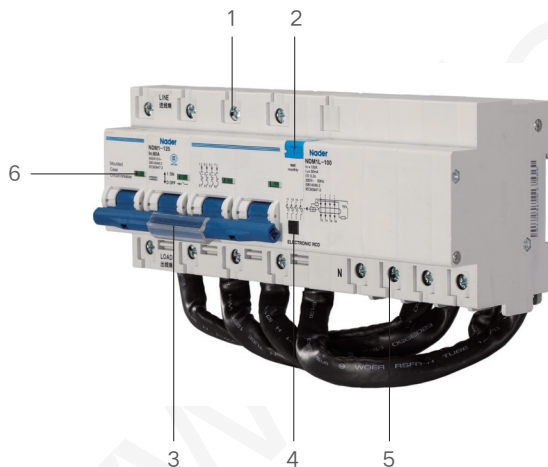
◆ NDM1L-32、50 External Diagram



NDM1L-32、50 External Structure Diagram :

- 1 : Line
- 2 : Test Button
- 3 : Operation Handle
- 4 : Reset Button
- 5 : Load

◆ NDM1L-100 External Diagram



NDM1L-100 External Diagram :

- 1 : Line
- 2 : Test Button
- 3 : Operation Handle
- 4 : Reset Button
- 5 : Load
- 6 : Status Indicated Window

● Standard

◆ Standard As Follow:

- ★ GB 16917.1 Residual current operated circuit-breakers with integral over-current protection for household and similar uses(RCBOs)-Part 1 : General rules
- ★ IEC 61009-1 Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses(RCBOs)-Part 1 : General rules

◆ NDM1L-100 Standard As Follow :

- ★ GB 14048.2 Low-voltage switchgear and control gear Part 2: Circuit-breakers
- ★ IEC 60947-2 Low-voltage switchgear and controlgear-Part 2: Circuit-breakers

3. Working Condition

● Applicable Condition

- ◆ Ambient Usage Temperature and Storage Temperature

Ambient Usage Temperature: $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$, Standard Temperature: $+30^{\circ}\text{C}$, correction factor of different ambient usage temperature refer to sheet 1

Storage Temperature: $-30^{\circ}\text{C} \sim +70^{\circ}\text{C}$.

- ◆ Altitude

The altitude of the mounting site $\leq 2000\text{m}$

- ◆ Relative Usage Humidity and Relative Storage Humidity

The relative humidity shouldn't exceed 50% when the ambient air temperature is $+40$ degrees, higher humidity can be allowed in lower temperature. For example, the humidity can be 90% when the ambient temperature is $+20$ degrees. Necessary measures should be acted for the condensation produced by the changed temperature.

● Pollution Degree

2

● Protection Level

Level of Product Protection: IP20

● Mounting Method

Mounted on TH35mm x 7.5 Standard Rail.

● Mounting Direction

- ◆ Vertical Mounting: The inclination between mounting plane and vertical plane should $\leq \pm 5$ degrees
- ◆ Horizontal Mounting

● Environmental Requirement

Comply with RoHS

4. Product Technical Characteristic

4.1 Model and Implication

No.	Implication	NDM1L		
1	Brand Code	ND : Nader		
2	Code	M : MCB		
3	Design Code	1		
4	Leakage	L: Leakage Functional Code (30mA, 50mA, 100mA, 300mA)	L: Leakage Functional Code (30mA, 50mA, 100mA, 300mA)	L: Leakage Functional Code (100mA)
5	Frame Rating	32A	50A	100A
6	Instantaneous Tripping Characteristics	B: Instantaneous Tripping Range $3I_n \sim 5I_n$; C: Instantaneous Tripping Range $5I_n \sim 10I_n$; D: Instantaneous Tripping Range $10I_n \sim 14I_n$;	B: Instantaneous Tripping Range $3I_n \sim 5I_n$; C: Instantaneous Tripping Range $5I_n \sim 10I_n$; D: Instantaneous Tripping Range $10I_n \sim 14I_n$;	C: Instantaneous Tripping Range $8I_n (1 \pm 20\%)$; D: Instantaneous Tripping Range $12I_n (1 \pm 20\%)$;
7	Rated Current	1A, 2A, 3A, 4A, 6A, 10A, 16A, 20A, 25A, 32A	6A, 10, 16A, 20A, 25A, 32A, 40A, 50A	50A, 63A, 80A, 100A
8	Over-Voltage and Under-Voltage Functional Code	/	No Code: Normal Leakage Products GQ: Indicates over-voltage and under-voltage protective function G: Indicates over-voltage protective function Q: Indicates under-voltage protective function	No Code: Normal Leakage Products GQ: Indicates over-voltage and under-voltage protective function G: Indicates over-voltage protective function Q: Indicates under-voltage protective function
9	Number of Poles	1PN、2P、3P 3PN、4P	1PN、2P、3P 3PN、4P	1PN、2P、3P 3PN、4P

4.2 Technical Parameters

	NDM1L-32	NDM1L-50	NDM1L-100
Rated Voltage (V)	AC230/240V(1PN、2P) AC380/400/ 415V(3PN、3P、4P)	AC230/240V(1PN、2P) AC380/400/ 415V(3PN、3P、4P)	AC230V(1PN、2P、3PN、4P) AC400V(3P)
Rated Current (A)	1、2、3、4、5、6、 10、16、20、25、32	6、10、16、20、25、 32、40、50	50、63、80、100
Tripping Characteristics of Residual Current	AC and ELE	AC and ELE	AC and ELE
Rated Residual Operation Current $I_{\Delta n}$ (mA)	30、50、100、300	30、50、100、300	100
Rated Insulated Voltage (V)	AC500V	AC500V	AC500V
Rated Ultimate Short Circuit Breaking Current I_{cu}	6kA (B、C) 4.5kA (D)	6kA (B、C6A~40A); 4.5kA (B、C50A、D)	10kA
Rated Short-Circuit Operation Breaking Current (Ics)	6kA (B、C) 4.5kA (D)	6kA(B、C6A~40A); 4.5kA (B、C50A、D)	10kA
Rated Residual Connecting and Breaking Current ($I_{\Delta m}$)	500A	500A	2500A
Rated Working Frequency (Hz)	50/60	50/60	50/60
Over-Voltage Operation Value and Time (Uover)	/	280V $\pm$ 12V/0.1s	280V $\pm$ 12V/0.1s
Under-Voltage Operation Value and Time (Uover)	/	170V $\pm$ 7V/1s	170V $\pm$ 7V/1s
Mechanical and Electric Life	20000	20000	20000
Connecting and Wiring Capacity	◆ Tunnel Connecting Terminal ◆ Terminal Connecting Area: 1~10 mm² cable is applicable ◆ Connecting Screw is M4, Torque is 1.2N.m	◆ Tunnel Connecting Terminal ◆ Terminal Connecting Area: 1~10 mm² cable is applicable ◆ Connecting Screw is M4, Torque is 1.2N.m	◆ Tunnel Connecting Terminal ◆ Terminal Connecting Area: 1~50 mm² cable is applicable ◆ Connecting Screw is M6, Torque is 4.0N.m
Certificate	CCC	CCC	CCC

● Temperature Correction Factor Sheet (1)

Ambient Temperature (°C) Correction Current (A) Rated Current (A)	-35	-30	-25	-20	-15	-10	-5	-0	5	10	15
1	1.27	1.25	1.23	1.21	1.19	1.17	1.15	1.13	1.10	1.08	1.06
3	3.89	3.83	3.76	3.70	3.64	3.57	3.50	3.44	3.37	3.30	3.22
6	7.70	7.58	7.46	7.34	7.21	7.09	6.96	6.83	6.70	6.56	6.42
10	13.89	13.62	13.35	13.07	12.81	12.53	12.23	11.93	11.63	11.33	11.01
16	20.78	20.43	20.08	19.75	19.40	19.05	18.70	18.33	17.96	17.58	17.20
20	25.67	25.28	24.88	24.47	24.06	23.64	23.22	22.78	22.34	21.89	21.43
25	32.21	31.72	31.22	30.70	30.18	29.65	29.10	28.55	27.98	27.41	26.82
32	41.04	40.46	39.82	39.17	38.51	37.84	37.15	36.47	35.75	35.03	34.30
40	51.63	50.86	50.04	40.21	48.37	47.51	46.63	45.74	44.83	43.90	42.95
50	64.92	63.97	62.92	61.86	60.77	59.67	58.54	57.40	56.23	55.05	53.81
63	83.48	82.06	80.64	79.19	77.72	76.22	74.70	73.14	71.54	69.91	68.24
80	135	130	126	122	118	115	112	108	104	99	95
100	160	155	150	146	142	137	133	129	125	122	118

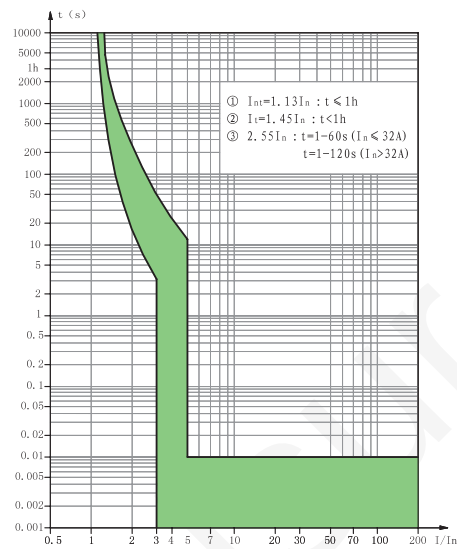
Ambient Temperature (°C) Correction Current (A) Rated Current (A)	20	25	30	35	40	45	50	55	60	65	70
1	1.05	1.02	1.00	0.97	0.94	0.91	0.89	0.86	0.83	0.80	0.77
3	3.14	3.06	3.00	2.92	2.84	2.76	2.67	2.58	2.49	2.38	2.27
6	6.27	6.14	6.00	5.84	5.68	5.52	5.36	5.19	5.01	4.83	4.64
10	10.67	10.34	10.00	9.63	9.24	8.85	8.45	8.01	7.55	7.06	6.55
16	16.80	16.40	16.00	15.55	15.11	14.66	14.20	13.71	13.21	12.70	12.75
20	20.96	20.47	20.00	19.47	18.95	18.42	17.87	17.30	16.71	16.10	15.47
25	26.22	25.61	25.00	24.33	23.67	23.00	22.28	21.56	20.80	20.02	19.21
32	33.54	32.77	32.00	31.17	30.34	29.48	28.60	27.69	26.75	25.78	24.77
40	41.98	40.99	40.00	38.93	37.85	36.75	35.61	34.43	33.21	31.95	30.63
50	52.56	51.28	50.00	47.82	46.24	44.81	43.33	41.81	40.23	38.58	35.77
63	66.53	64.78	63.00	60.11	58.19	56.21	54.16	52.03	49.81	47.50	43.05
80	91	88	85	82	80	75.5	72.5	68	64.5	58	52.5
100	114	111	108	103	100	94	88	82	75	68	58

4.3 Tripping Curve

4.3.1 NDM1L-32、NDM1L-50 Tripping Curve

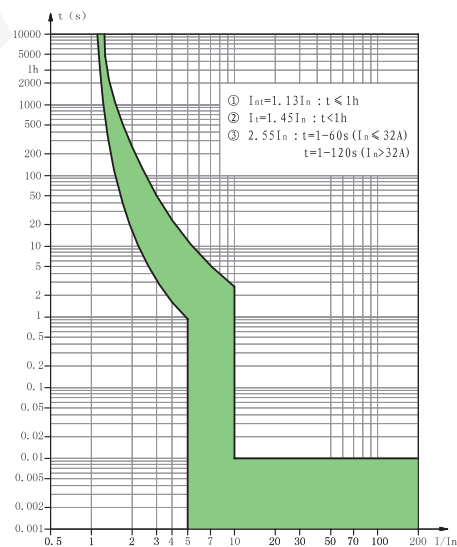
● B Curve

- ★ Protect non-inductive and micro inductive circuits
- ★ Rated Current: 1A-63A
- ★ Tripping Characteristics: Instantaneous tripping range: $3I_n-5I_n$



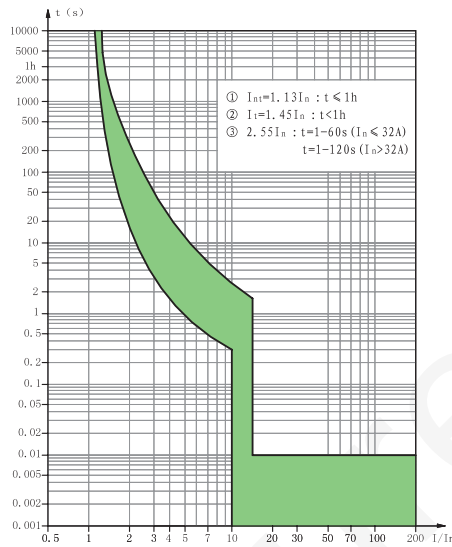
● C Curve

- ★ Protect Nominal Load and Distribution Cables
- ★ Rated Current: 1A-63A
- ★ Tripping Characteristics: Instantaneous tripping range: $5I_n-10I_n$



● D Curve

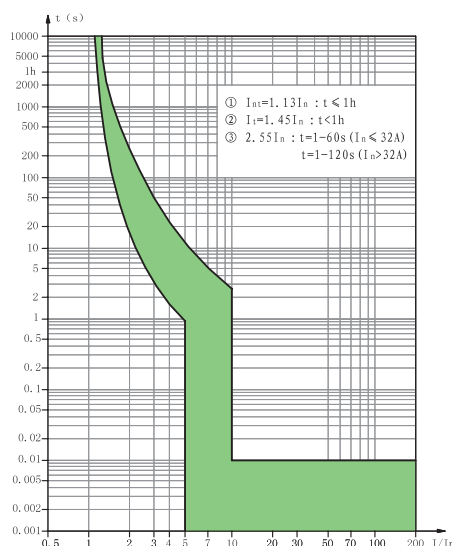
- ★ Protect industrial distribution systems
- ★ Rated Current: 1A-63A
- ★ Tripping Characteristics: Instantaneous tripping range: $10I_n$ - $14I_n$



4.3.2 NDM1L-100 Tripping Curve

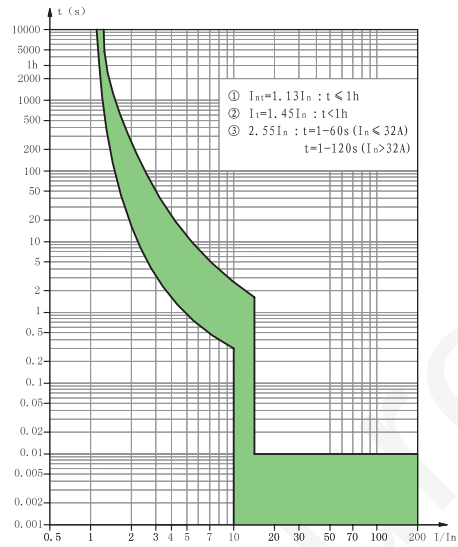
● C Curve

- ★ Protect Nominal Load and Distribution Cables
- ★ Rated Current: 50A-100A
- ★ Tripping Characteristics: Instantaneous tripping range: $8I_n (1 \pm 20\%)$

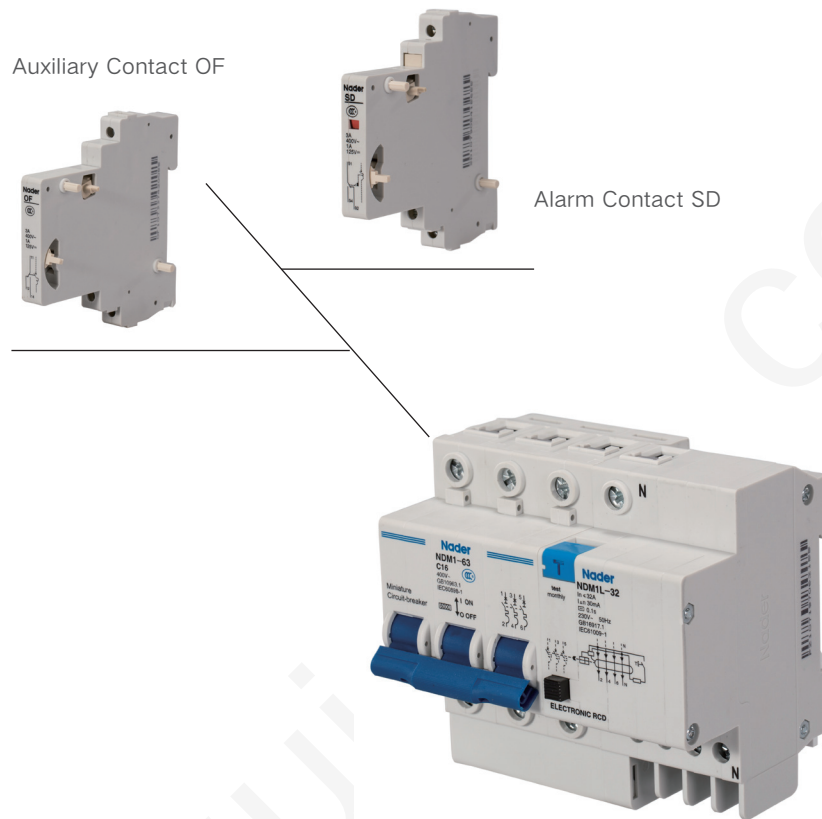


● D Curve

- ★ Protect industrial distribution systems
- ★ Rated Current: 50A-100A
- ★ Tripping Characteristics: Instantaneous tripping range: $12I_n$ ($1 \pm 20\%$)



5. Accessory



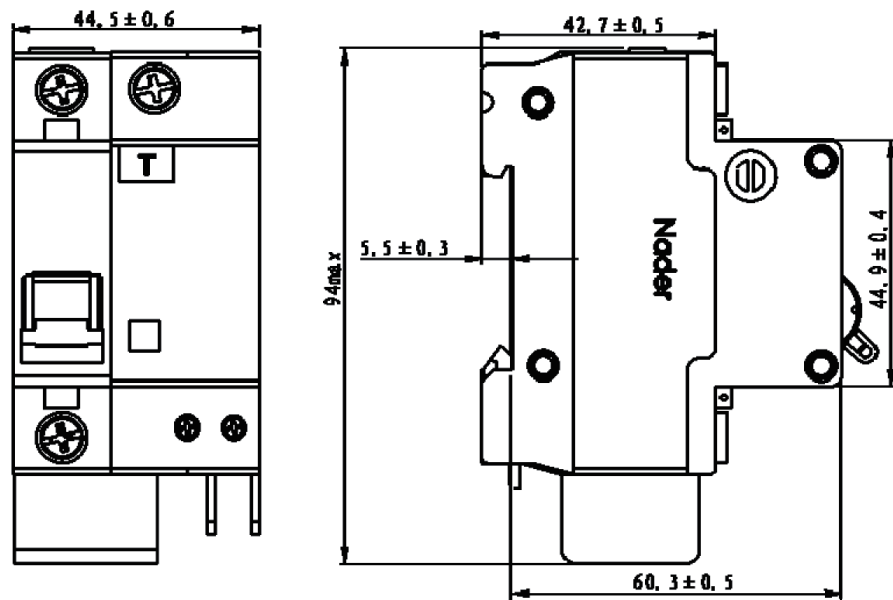
NDM1L-32、NDM1L-50、NDM1L-100 Accessory Types

No.	Name	Accessory Code	Function and Matched Quantity
1	Auxiliary Contact	OF	Linked to the left side of MCB to indicate OPEN or CLOSE status of the associated breaker. Matched quantity: Max 3 Pcs
2	Alarm Contact	SD	Linked to the left side of MCB to indicate the accidental tripping status of the associated breaker. Matched quantity: 3 Pcs Max.

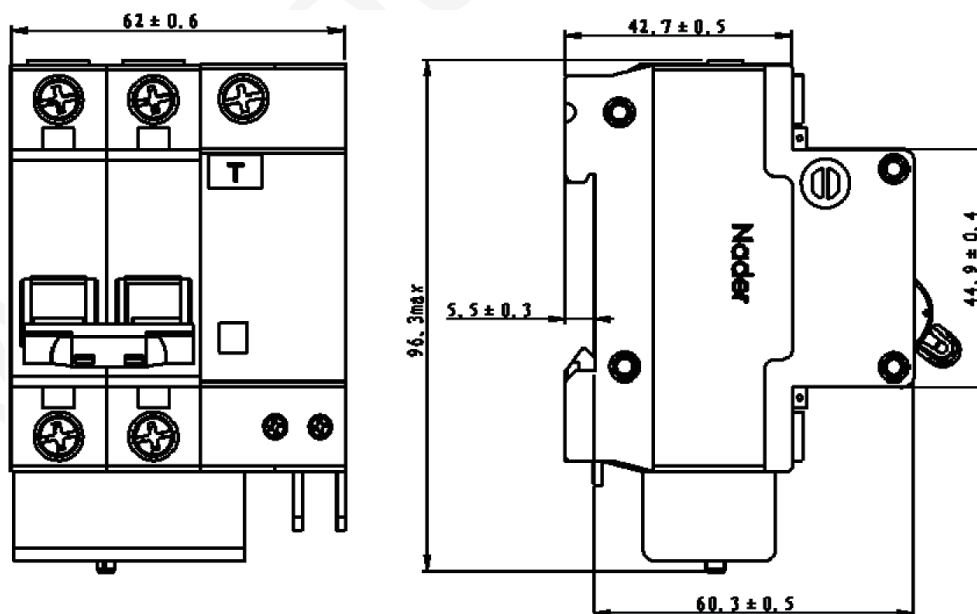
Note: Accessory parameters, please refer to "OF、SD" specimens.

6. Outline and Mounting Dimension

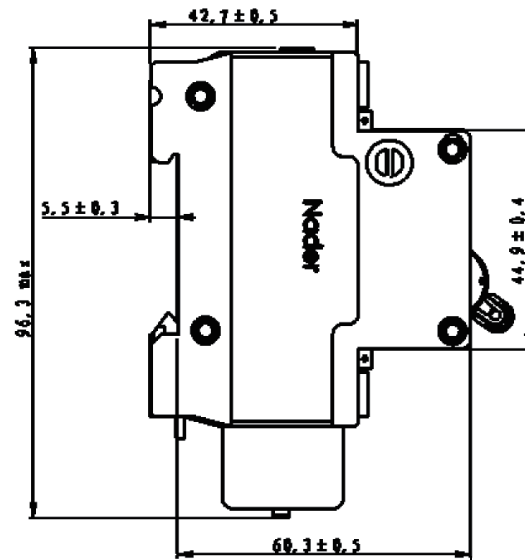
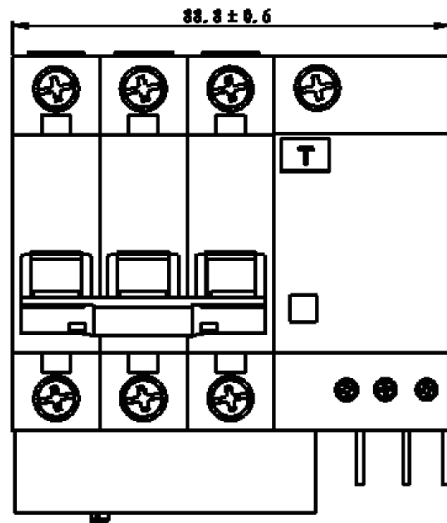
6.1 NDM1L-32 Rail Mounting Dimension



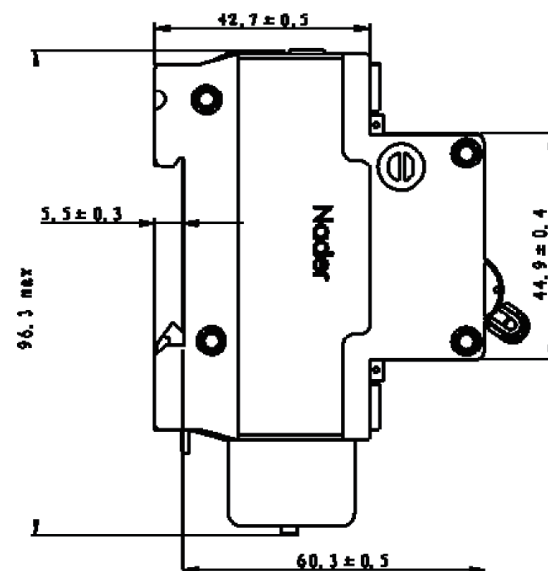
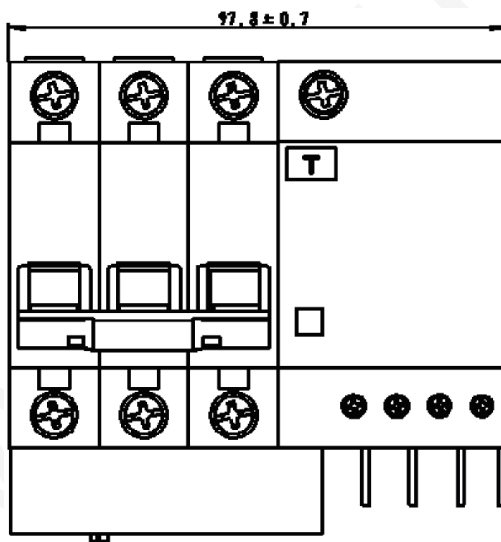
1P+N



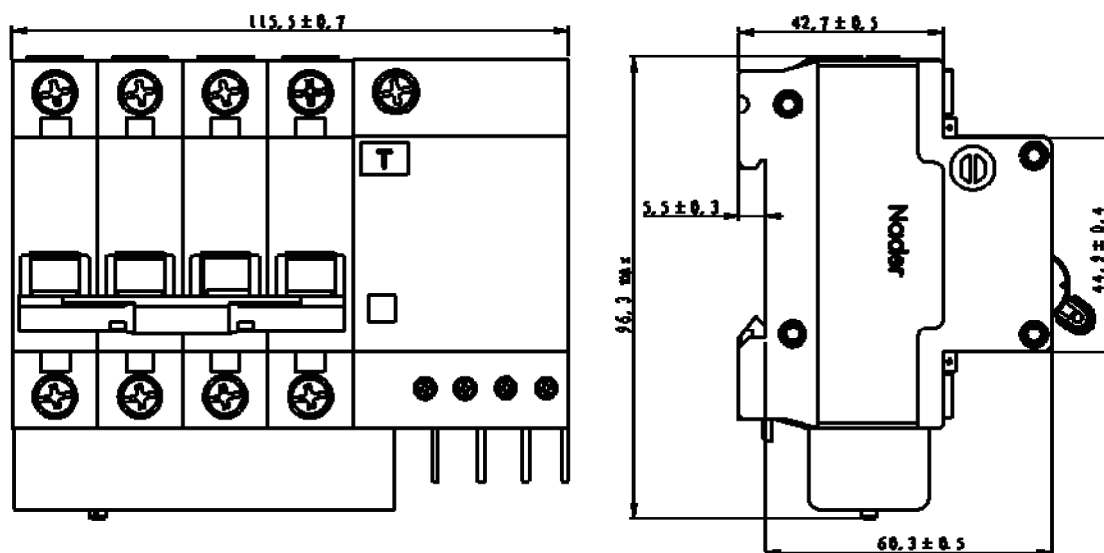
2P



3P

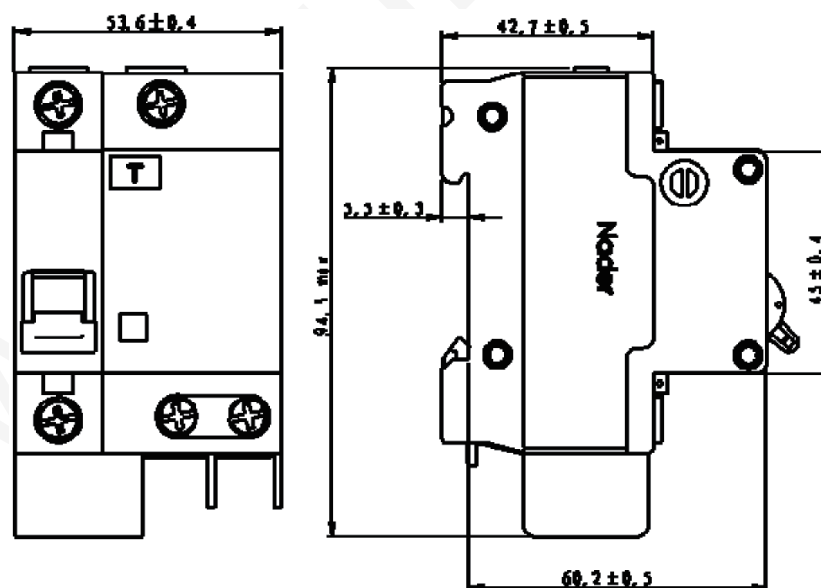


3P+N

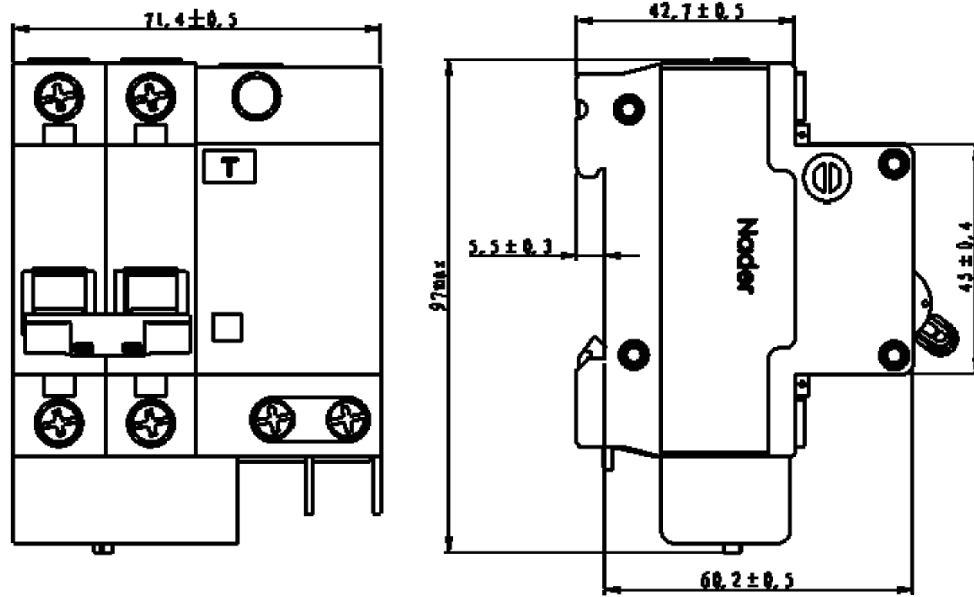


4P

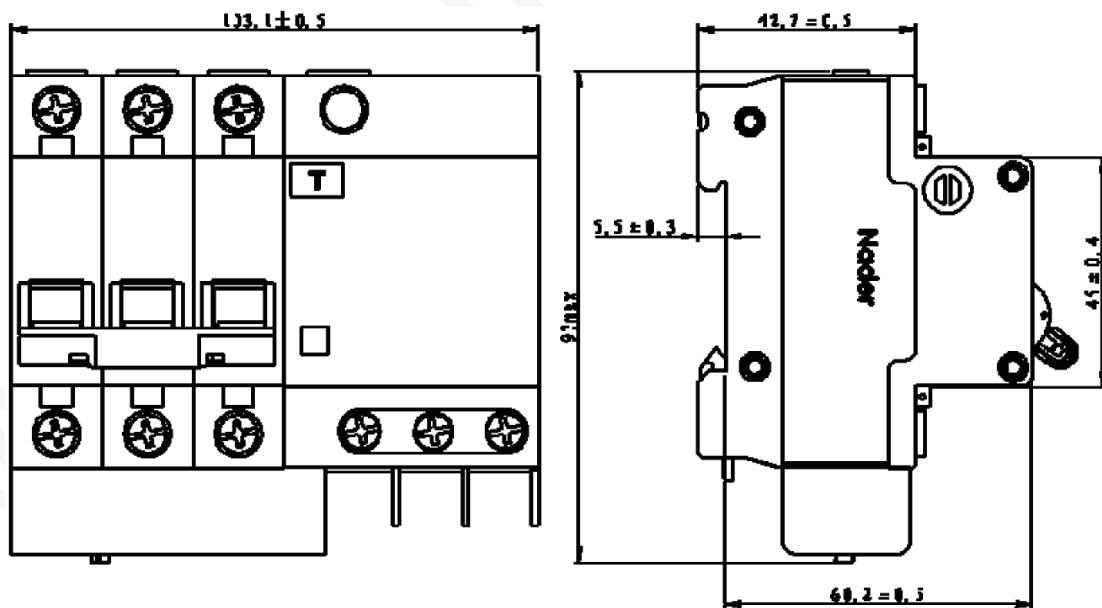
6.2 NDM1L-50 Rail Mounting Dimension



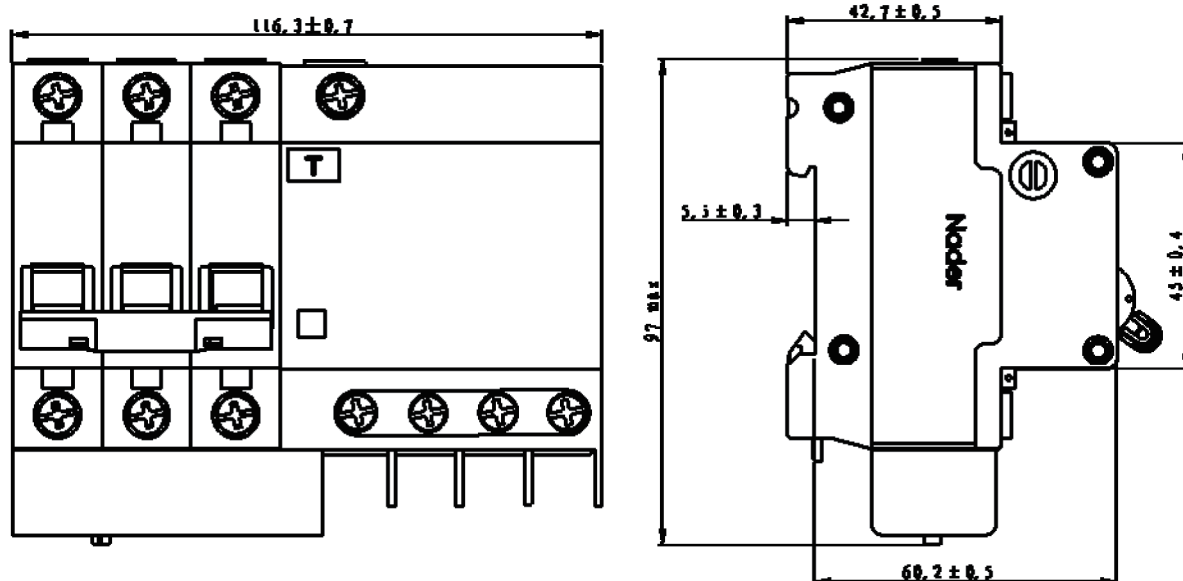
1PN



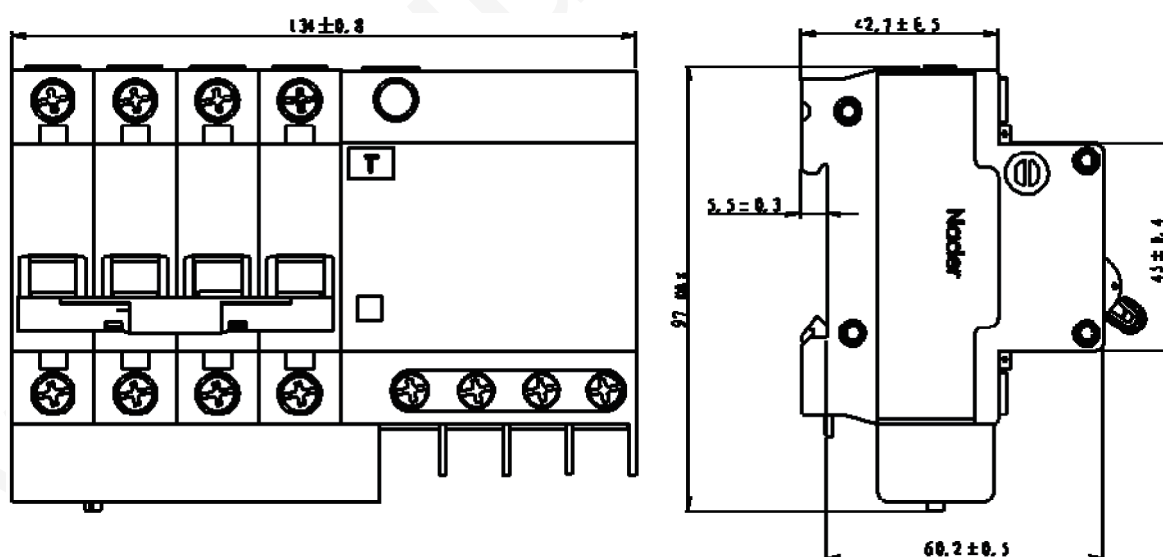
2P



3P

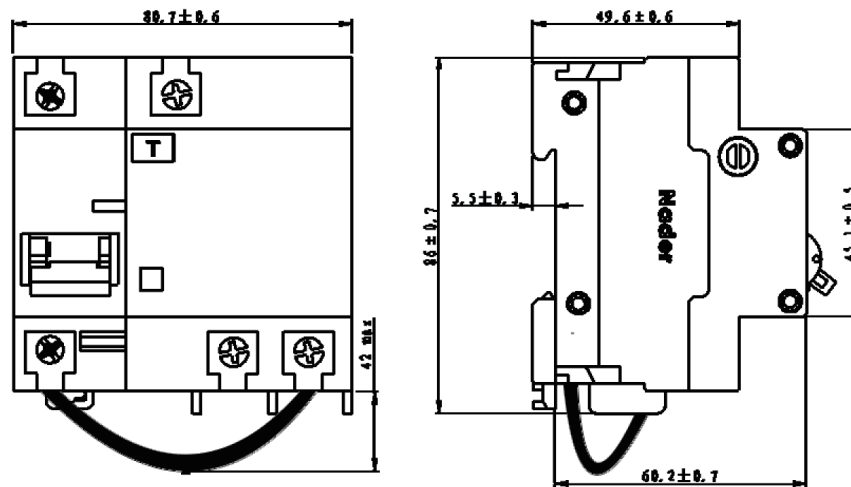


3PN

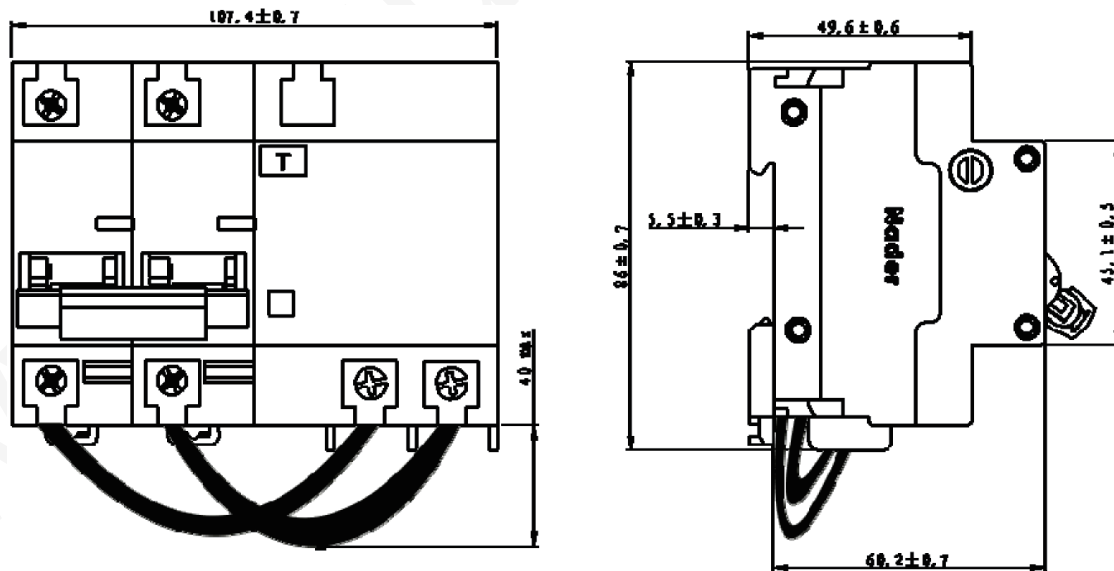


4P

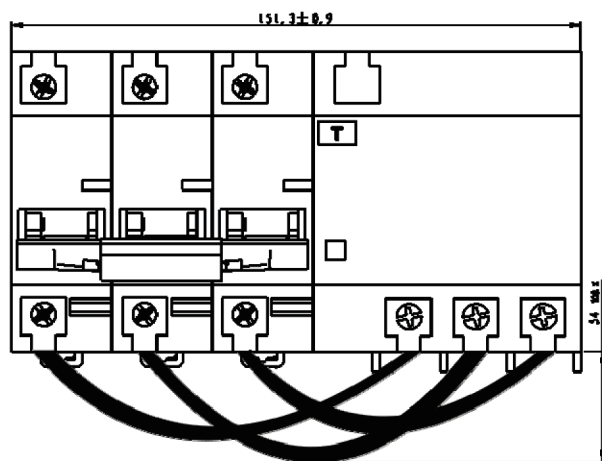
6.3 NDM1L-100 Rail Mounting Dimension



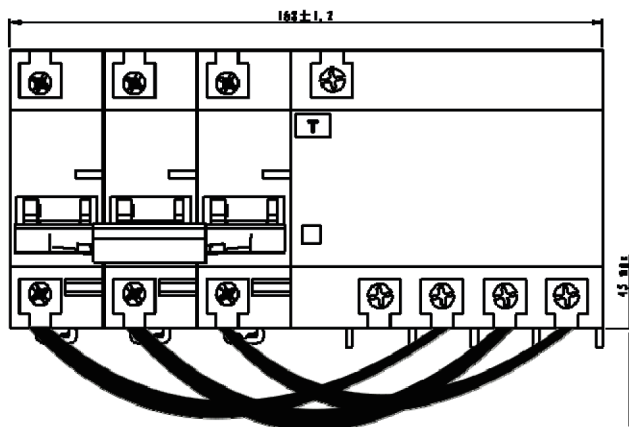
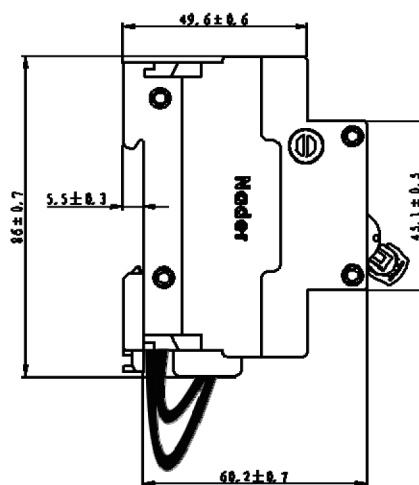
1PN



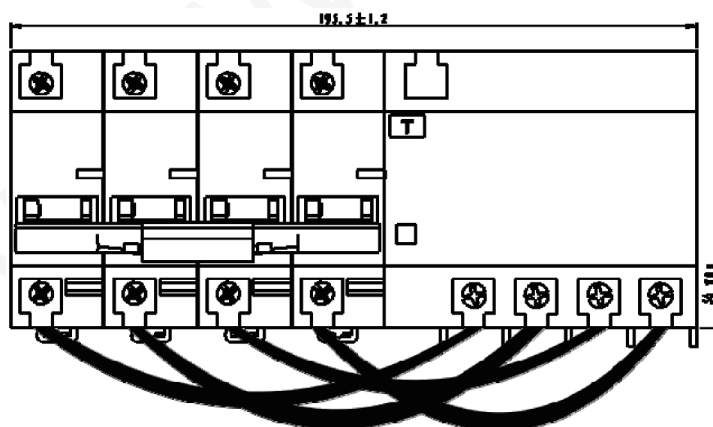
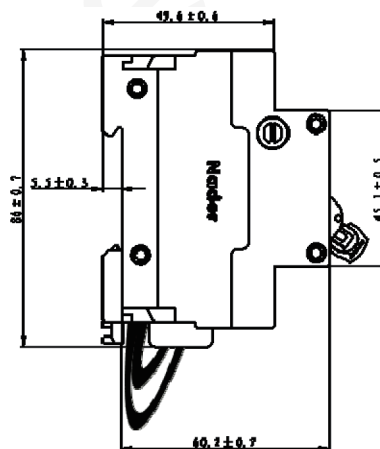
2P



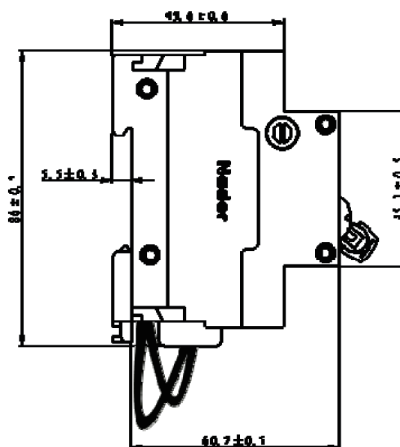
3P



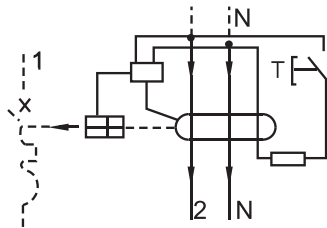
3PN



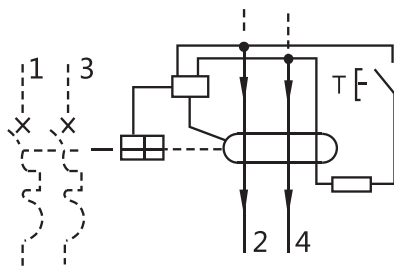
4P



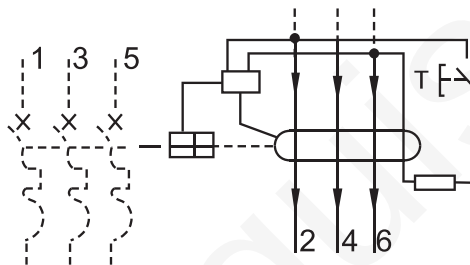
7. Wiring Diagram



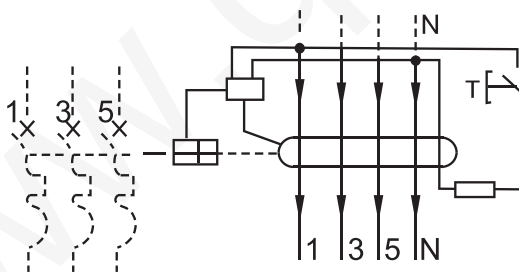
1PN Wiring Diagram



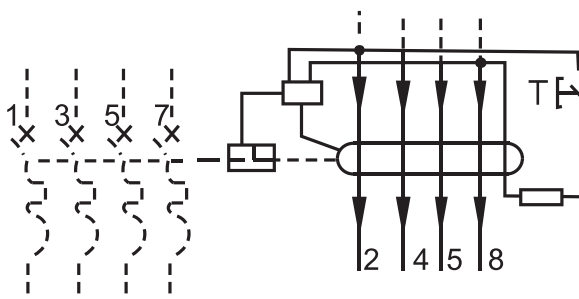
2P Wiring Diagram



3P Wiring Diagram



3PN Wiring Diagram



4P Wiring Diagram